



A CRITICAL ANALYSIS ON THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON TEACHING AND LEARNING IN KENYAN PUBLIC SECONDARY SCHOOLS

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Abstract:

Integration of ICT with education is rapidly becoming a crucial issue in modern education policy. Many experts in education agree that when ICT is properly applied in teaching and learning, it contributes infinite benefits in enhancing teaching and learning as well as creating other related ICT opportunities. Actually, this has triggered the industrialized nations in the world to equip their learning institutions with computers and employing professional tutors to assist students become proficient and efficient in technology. ICT in education improves instructional delivery process hence enhancing learners' participation during teaching and learning process. Developed nations like USA have invested so much on research and publications on ICT related areas for use in their educational institutions. In 1995, the USA government bought more than one million computers to be used in elementary schools and over fifteen million in secondary schools. As reported by Chin and Bergheim (1984), the US government's fiscal year of 2001 budgeted over \$529 million for computer training in schools. In response to the Education Reform Act of 1988, the British government spent over \$324 million in sponsoring the use of computers in schools' management and administration. Britain and United States have been spending so much on ICT in education since then as well as other industrialized states. Developing countries have recently started to embrace ICT through construction of ICT enabled environments equipped with internet connectivity technologies. These ICT technologies facilitate connection of different learning institutions in order to exchange/share learning materials, enhance academic

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performance in education and improve cultural understanding among different people worldwide. Kenya has the potential of being among the major world market players in ICT by reinforcing her ICT policy in secondary schools through the ministry of education. ICT may act as a: supporting tool during instruction delivery process; management tool for economic development and high technological instrument for development. This research was aimed at exploring the impact of information and communication technology in teaching and learning in Kenyan public secondary schools.

Keywords: ICT, motivation, impact of information and communication technology in education, academic performance and learner's attitude

1. Introduction

Many nations all over the world currently regard using ICT skills and concepts in education alongside reading, writing and proficiency. Computers play an important role in every aspect of our society. Hardly does a day pass without one coming across a computer system that is used in offering services that were initially done conventionally. According to a United Nations report (1999), Information and communication technology (ICT) has been applied in various areas such as in the development of financial systems, retail systems, reservation systems, educational systems, communication systems, industrial systems, scientific and research systems, library systems, entertainment systems, transportation systems, home use, office expert systems, marketing, virtual reality systems and law enforcement systems which have all contributed to industrialization and modernization of a country.

According to UNESCO (2002), ICT is observed as an arrangement of information and mathematic technology, people, telecommunication technology with both software and hardware inclusive. Information and communication technology in education has beyond doubts affected teaching, learning, and research as cited by Yusuf (2005). According to Al-Ansari (2006), Intensive research has proven that ICT has led to many benefits positively affecting the quality in education. ICT has the capability to transform, hasten, supplement, and expand skills, stimulate and actively involve students in performing experiments in school as well as consolidation teaching and learning institution for transformation and exchange of information as cited by Davis and Tearle (1999). Much has been whispered and conveyed about the power of technology especially through the use of computers in education as stated by Jhuree (2005). Originally computers were used as a teaching tool in programming but in the

wake of development in microprocessor in early 1970s, it saw the introduction of inexpensive personal computers into learning institutions. Since then, the use of these microcomputers has increased at a higher rate. ICT applications have become more unavoidable in peoples' life leading to great desire for skills in computing in their daily life. Although at present computers haven't been wholly incorporated in the learning of traditional subject matter, digital contents in teaching and learning boosts the understanding capabilities of learners hence enhancing their learning abilities. The 1990s was characterized by massive ICT usage and its access probably due to availability of networked internet enabled systems providing various services such as electronic learning, distant learning, virtual learning institution and electronic business.

2. Statement of the Problem

In 2005, the Ministry of education in Kenya highlighted ICT as significance factor to achieving her Vision 2030, Many Principals have not yet fully purchased and installed ICT technologies in their learning institutions. The ministry of education has also been so reluctant in reinforcing the policy as inadequate budgetary allocations for purchase and support of ICT in secondary schools has been made. There has been constant poor performance in the Kenya Certification of Secondary Education (K.C.S.E) resulting to mass cheating and other irregularities in the examinations. The factors attributed to these examination crimes is due to learners being unable to learn and retain the contents learned for a long time or there is little learning in classroom leading to poor preparations for the examination. It's for these reasons why the researchers decided to carry out this research for the Kenyan government to understand the great role played by ICT in education sector for both the teacher and the learner.

3. Purpose of the Study

The importance of this research is to critically analyze the impact of information and communication technology on teaching and learning strategies in Kenyan public secondary schools. This was in light with the objectives which focused on the impact of ICT in enhancing teaching and learning preparation process, quality and accessibility of education for tutors and learners, learning environment for learners, learning motivation for teachers and learners and the academic performance of learners in Kenyan secondary schools.

4. Research Objectives

1. To critically analyze the impact of information and communication technology on teaching and learning preparation process in Kenyan public secondary schools.
2. To critically analyze the impact of ICT in enhancing the accessibility of education for tutors and learners in Kenyan public secondary schools.
3. To critically analyze the impact of ICT in enhancing learning environment for learners in Kenyan public secondary school.
4. To critically analyze the impact of ICT in enhancing learning motivation for learners in secondary schools in Kenya.
5. To critically analyze the impact of ICT in enhancing the academic performance of learners in Kenyan public secondary schools.

5. Research Questions

1. How does the impact of information and communication technology on teaching and learning process in Kenyan public schools?
2. To what extent does the impact of ICT enhance the quality and accessibility of education for tutors and learners in Kenyan secondary schools?
3. How does the impact of information and communication technology enhance learning environment for learners in Kenyan secondary schools?
4. Does the impact of information and communication technology enhance learning motivation for teachers and learners in public secondary schools in Kenya?
5. How does the impact of ICT enhance the academic performance of learners in Kenyan secondary schools?

6. Research Methodology

The methodology employed was qualitative research method with a critical analysis design; the scholar critiqued existing literature on subject area through thematic analysis and content analysis. The researcher used the investigation to come up with the recommendation on what was to be done to ensure that ICT in education for learners was urgently implemented so as to enhance teaching and learning.

7. Literature Review Critique

7.1 A critical analysis of the impact of information and communication technology in enhancing teaching and learning process in Kenyan public secondary schools

The integration of ICT in education promotes performance and proficiency in the preparation of teaching and learning process. The diffusion of information and communication technology in education helps in stimulating tutors and learners by enabling teachers to do thorough research on the areas they are not familiar with, clearing terms and concepts and equipping themselves with quality teaching resources and materials (instructions) before presenting them to the learner. Through the use of ICT in education, the tutors may vary the methods of instruction delivery to learners hence arousing their curiosity to learn more without getting bored. This may boost their morale of participating actively in teaching and learning process.

For the impact of information and communication technology in education to be felt and achieved, tutors need to be involved in the ICT capacity project planning, implementation and intervention strategies (Zhao and Cziko, 2001). Harris (2002) after conducting a case study in both primary and secondary learning institutions which focused on the use of ICT in educational systems concluded that; for the advantages of ICT to be felt, the tutors confidence was required and that they needed to willingly explore new avenues for transforming their classroom atmosphere by use of ICT.

Integration of Information and communication technology with education systems leads to increased collaboration with other scholars in the world hence being able to exchange ideas and information. Teaching and learning opportunities in ICT in the ways of instruction delivery and the methodologies the tutors use in teaching and learning give way to new strategies favoring the learners as well as collaborative learning. Learners are enabled to accessing information from different sources and also sharing such with other students elsewhere online. This leads to enhanced retention of the learnt contents thus enhancing performance in all examinations.

7.2 A critical analysis of the impact of ICT in enhancing the accessibility of education for tutors and learners in Kenyan public secondary schools

Information and communication technology escalates education flexibility and delivery hence learners can access knowledge anywhere and anytime in the world. It influences the manner in which teaching of learners is done hence leading to learner driven processes. This improves learner's preparedness for long life learning and quality of learning together with its content. In the systems of education, one of the vital contributions of ICT is- Easy Access to a variety of information and Learning resources

anywhere and anytime with varying simplicity. ICT has enabled learners to browse through the internet for learning resources such as electronic books, samples of preceding years' examination papers, examination formats and other exam related revision materials. ICT has also made learners to globally access resourceful persons, counselors, professionals, examiners, mentors and other educational specialists with ease. Education may become very flexible after its integration with ICT hence skyrocketing to real time learning providing more learning chances for a big number of learners who previously were prohibited to such opportunities by other unconstructive commitments as reported by Young (2002). Through ICT, academic institutions are able to link up learners anywhere in the world and effectively deal with the emerging international educational markets. This is because education can take place anytime and anywhere with educators becoming more competent in their tasks as they may attend different virtual classrooms in different remote locations at the same time.

When ICT is used effectively in education, it could bridge the digital divide among different countries globally. With ICT integration in education, issues might be easily dealt with as associated with affordability, scarcity of tutors, education quality as well as overcoming barriers of distance and time as reported by McGorry (2002). ICT may enable creation of digital resources such as digital libraries which can be used by learners, teachers and professionals to carryout research and access course materials anywhere at their time of convenience. ICT links academics and researchers globally leading to interactions of learners and tutors from all over the world and exchange of academic programs and materials. ICT eliminates redundancies of work and information according to Cholin (2005).

7.3 A critical analysis of the impact of ICT in enhancing learning environment for learners in Kenyan public secondary schools

With introduction of ICT in education sector, learners may be presented with new environment for learning requiring a set of skills necessary for a successful person in a civilized nation. Such skills may include critical thinking skills, investigation skills, and assessment and evaluation skills. These skills may grow to be of great importance to learners and help them to acquire massive information from different sources as reported by New Media Consortium (2007). Information and communication technology may be used in transforming educational processes through resource accumulation and provision of liveliness in learning environments such as virtual environments.

Nowadays, there is extensive dissemination of information through the use of ICT in a world that is dominated by youths who are generally referred to as digital generation. It is very clear that ICT may today affect the entire learning process and

in the days to come. Conducive environment for learning is needed so as to reflect the possible relevant applications of knowledge by learners to accurately demonstrate and apply the acquired knowledge instead of becoming (Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990; Duffy & Knuth, 1990). Instructors should inspire learners to involve themselves in a lively knowledge building practices and activities through being innovative and creative and embracing ICT in searching for relevant knowledge and facts.

ICT may contribute to creation of favourable environments for learning which are more powerful and in various forms. This is because information and communication technology avails openings for accessing large volumes of information by use of numerous information technological facilities like mobile phones, televisions and many others and observing the information from numerous perceptions, thus emphasizing the authenticity of learning environment. Through simulations, information and communication technology simplifies sophisticated jobs/tasks and instructions for learners hence making them to master them with ease. Kennewell et al. (2000) cited that computers essentially placed in a classroom maximize the chances for prospectus action. Information and communication technology environment simplifies the interaction of the learners and tutors leading to time utilization and achievement of better results.

7.4 A critical analysis of the impact of information and communication technology in enhancing learning motivation for learners in secondary schools in Kenya.

ICT may be used to add quality to education as it; increases learner's motivation and engagement, enables basic skills acquisition and enhances instructor training. Computers with Internet connectivity allow smart teaching methodologies resulting to learning in a better way than it used to be done before. ICT may have a greater positive impact on learners not only on what they learn, but may play an important role on how the learners learn. Curricula's mode of content delivery may change from being teacher-centered to learner-centered. ICT motivates the learner through the use of multimedia systems and software that engages the learner by arousing curiosity during learning process hence doing away with boredom. use of sound effects, animations, songs, dramatizations, comic skits, and other conventional modes of information delivery induce the learners to remain focused and promote active participation during instruction delivery process. Approaches of learning using information and communication technology may increase opportunities for beneficial learning as they facilitate and backup material-based, learner-centered environments thus enabling

students to be able to relate to examination structure and to rehearsal (Berge, 1998; Barron, 1998).

According to Reeves and Jonassen (1996), learning using ICT makes learners become engrossed inside the system in the learning process like as encountered with virtual reality. Educators organize and develop a more welcoming talk that is more interesting, appealing and lively to the learners. This is achieved by using technologically enabled systems which enables learners to actively participate in the classroom and understand better the instructions being delivered with ease. This helps the learners to retain in their minds what they have learnt for a longer span. This leads to excellent performance in their examination.

With computers networked and connected to the internet, learner's motivation is raised higher. This provides the learner with a chance to link with other people globally and take part in real events in the world. Information and communication technology can engross and motivate learners which has been mentioned as influencing factor in learning (Long, 2001; Wood, 2004)

7.5 A critical analysis of the impact of information and communication technology on enhancing the academic performance of learners in Kenyan public schools.

ICT may help in expanding the space to accessing education and empower the importance of schooling to learners through progressively digitalizing workplaces hence improving the quality of educational. The connection between information and communication technology usage with learner's performance in academics has been the center of interest for researchers. The 21st century has seen digital technologies find their way in education systems and producing positive effects/impact on attitude of learners and their achievement.

According to Kulik's (1994), it has been revealed that the students who learn using ICT perform better than learners who don't use technology. The learners who utilize the power of ICT-based instruction in their learning take less time to understand and are highly motivated. Research has shown that there is positive association between the ICT availability in learning and learners' performance. Becker (2000) reported that information and communication technology adds learner commitment and reduces the time spent by students outside class doing unconstructive work. Computers connected to Internet facilitate provide innovativeness and impressive methodologies and act as a means of acquiring knowledge for similar tasks better than before. ICT may enable learners to join collaborative groups that develop outputs that characterize what is being learnt in schools thus changing their interaction with the content according to Windschitl (2002).

8. Conclusions

This critical analysis is sought to investigate the effective roles of ICT as a major player in growth and production of quality education as we move toward the middle of 21st century and beyond. Information and communication technology has greatly affected educational appliances in education in many developed nations but in Kenya, its use is limited but its usefulness shall increase over the years. Information and communication technology is becoming a stronger agent for change among many educational institutions all over the world. ICT within the education setup will positively affect; teaching and learning progressions, quality of education and its accessibility, teaching and learning motivation and learning environments. ICT in education has greater positive impact on teaching and learning and also research.

Information and communication technology influences education delivery and provides a broader access to information anytime and anywhere in the global village. In addition to that, ICT increases learner's flexibility and access to educational resources irrespective of time, geographical boundaries and barriers. It influences the manner in which learners can learn and how they are taught. ICT provides richer environment in education process by motivating both teachers and students. Information and communication technology has a philosophical effect on education through provision of fresh and diverse information for students and tutors. Such opportunities ICT add greater effect on learner's academic achievements in education. The overall literature suggests that successful ICT integration in education may help Kenya in achieving its Vision 2030.

9. Recommendations

The researchers made the following recommendations:-

1. Information and communication technology be integrated in education as this might lead to enhancement in teaching and learning preparation process.
2. With ICT integration in education, it may enhance the quality and accessibility of education for tutors and learners. This would enable learners and teachers in different remote locations to interact with ease and exchange learning programmes.
3. When ICT is used in education, it might enhance learning environment for learners in Kenyan public secondary school leading to enhanced performance in examinations.

4. ICT might have a great impact in teaching and learning strategies as it may enhance learning motivation for teachers and learners in schools. This may make the learner perform exceeding good in the terminating examinations.
5. Information and communication technology may enhance the academic performance of learners in hence leading to growth and development of our country due to having a great number of elites in the society.

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